



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,637	06/20/2003	David A. Hayner	1280.SC12755TS	7168
34814 7590 10/16/2007 LARSON NEWMAN ABEL POLANSKY & WHITE, LLP 5914 WEST COURTYARD DRIVE SUITE 200 AUSTIN, TX 78730			EXAMINER CHU, KIM KWOK	
			ART UNIT 2627	PAPER NUMBER
			MAIL DATE 10/16/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/600,637	Applicant(s) HAYNER ET AL.	
	Examiner Kim-Kwok CHU	Art Unit 2627	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Remarks filed on 8/2/2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Remarks

1. Applicant's Amendment and Remarks filed on August 2, 2007 have been fully considered.

With respect to the rejected Claims 21, 23 and 31, Applicant disagrees that the prior art of Watanabe et al. (US 6,298,019) teaches serial connected gain change means 121, 122 and 127 as illustrated in Fig. 1 (page 3 of the Remarks, lines 1-3). Furthermore, Applicant states that the arrows connecting the gain change means 121, 122 and 127 in the prior art of Watanabe's Fig. 1 are merely a drafting artifact (page 3 of the Remarks, last two lines).

Accordingly, the prior art of Watanabe's gain change means 121, 122, 127 and the DSP 129 form a combined servo control loop (Fig. 1). Therefore, all the gain change means 121, 122 and 127 are physically bridged together by the DSP 129.

On the other hand, even the gain change means 121, 122, 127 cascaded in a series loop by the illustrated arrows are a drawing artifact to avoid cluttering the drawing as Applicant explained (page 3 of Remarks, lines 10 and 1), the DSP 129 still receives input signals from all gain change means 121, 122 and 127 and output controls signals to the gain change means according to the inputted signals as a single combined servo loop. For example, Figs. 11 and 12 illustrated that the tracking servo is turn on when the focusing servo operation lead in is confirmed (step S10;

column 27, lines 31-36).

Based on the prior art of Watanabe's arguable drawing Fig. 1, Applicant further states that Watanabe does not teach the Claim 1's limitation "to provide a signal with decoupling compensation for a first actuator based on the representation of the second actuator position" (page 4 of the Remarks, lines 9 and 10). Accordingly, the prior art of Watanabe teaches that the tracking gain is learned at the previous focusing jumping (column 39, lines 27-34). In other words, the prior art of Watanabe teaches "to provide a signal (track gain) with decoupling compensation (optimal) for a first actuator (tracking servo) based on the representation of the second actuator position (focusing jumping)" as in Applicant's Claim 1.

With respect to Claims 26 and 36, Applicant does not agree that the prior art of Watanabe teaches "decoupling matrix" and "cross-coupling characteristics" (page 5 of the Remarks, second paragraph). Accordingly, the prior art of Watanabe's DSP 129 coordinates the focusing and tracking servo operations (Figs. 11 and 12; column 27, lines 31-36; column 39, lines 27-34) by computing depending servo parameters such as amplifier gains, signals amplitudes, signal frequencies etc. of the focusing and tracking actuators. Such servo parameters form a matrix as a set of input/output signals to the DSP 129. In addition, the

input/output signals can be considered as a cross-coupling characteristics because the input signals affects all the DSP's outputs.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

*A person shall be entitled to a patent unless--
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.*

3. Claims 21-37 re rejected under 35 U.S.C. § 102(b) as being anticipated by Watanabe et al. (U.S. Patent 6,298,019).

4. Watanabe teaches a disk servo control method having all of the steps as recited in claims 21 and 22. For example, Watanabe teaches the following:

(a) a first actuator control law portion 120 comprising an input 116,117 to receive a representation of a first actuator position (Tracking error), and an output TC (Fig. 1; column 17, lines 61-64; the tracking servo circuit has an input and an output) a second actuator control law portion 1133 comprising an input to receive a representation of a second actuator position (focusing

error), and an output FC; (Fig. 1; column 18, first two lines; the focusing servo circuit has an input and an output); a first actuator decoupler portion 129 comprising a first input TE coupled to the output of the first actuator control law portion 120 and a second input FE coupled to the output of the second actuator control law portion 133 (Fig. 1; both TC and FC are connected to DSP 129), and an output (connected to the gain changers) to provide a signal with decoupling compensation (gain) for a first actuator (tracking actuator 130) based on the representation of the second actuator position (TC is compensated by a gain change means 122 which based on the gain chain 121 of the second actuator control law portion 133; column 39, liens 27-34).

(b) With respect to Claim 22, the first actuator decoupler 129 comprises a linear modification module (amplifier in the DSP) having an input FE coupled to the output of the second actuator control law portion 133, and an output to provide a linearly scaled representation of a value received at its input (Fig. 1; DSP provides linearly scaled output such as digitization and amplification); wherein the linearly scaled representation is used to provide the signal with decoupling compensation for the first actuator decoupler portion (Fig. 1; gain compensation means 121, 122 and 127 are a series of feedback means).

5. Watanabe teaches an optical disk drive having all of the elements and means as recited in claims 23-25. For example, Watanabe teaches the following:

(a) a focus control loop (Fig. 1; focusing is a servo operation); a tracking control loop (Fig. 1; focusing is a servo operation), wherein the focus control loop and the tracking control loop are cross-coupled (Fig. 1; gain change means 121, 122 and 127 provide the cross link), wherein a focus control command (operation) excites (starts/causes) the tracking control loop (read track address and then track jump) and a tracking control command excites (starts/causes) the focus control loop (track jump and then focus on the seek target); and a decoupler 129 configured to produce a modified focus control command (gain change) from the focus control command and the tracking control command (gain change means 121, 122 and 127 are in form of a cascade stage), and configured to produce a modified tracking control command (gain change) based on the tracking control command and the focus control command (Fig. 1), wherein the modified focus control command has a different excitation (different gain change) of the tracking control loop than the focus control command and wherein the modified tracking control command has a different excitation (different gain change) of the

focus control loop than the tracking control command (Fig. 1).

(b) With respect to Claim 24, a lens assembly 105, wherein the focus loop comprises a focus actuator 103, 104 configured to move the lens assembly in a focus direction (Fig. 1).

(c) With respect to Claim 25, a lens assembly 105, wherein the tracking loop comprises a tracking actuator 103, 104 configured to move the lens assembly in a tracking direction (Fig. 1).

6. Claims 26-30 have limitations similar to those treated in the above rejection, and are met by the reference as discussed above. Claim 26 however also recites the following limitations which are also disclosed by the prior art of Watanabe:

(a) with respect to Claim 26, determining cross-coupling characteristics (servo gains) of a focus actuator and a tracking actuator of an optical pickup unit (Fig. 1; gain means 121, 122 and 127 for focusing and tracking operations are a servo loop which can be considered as a cross-coupling characteristics); determining a decoupling matrix to decouple the focus actuator and the tracking actuator (Fig. 1; DSP 129 and gain change means forms a

servo loop having servo parameters which can be considered as a de-coupling matrix of tracking and focusing).

7. Claims 31-35 have limitations similar to those treated in the above rejection, and are met by the reference as discussed above. Claims 32-35 however also recite the following limitations which are also disclosed by the prior art of Watanabe:

(a) with respect to Claim 32, the decoupler 129 modifies a focus command to have a reduced effect on a tracking position of the lens assembly and modifies a tracking command to have a reduced effect on a focus position of the lens assembly (Fig. 1; gain change means 121, 122 and 127 are cascaded in a series mode which modifies a tracking mode and a focusing mode).

(b) with respect to Claim 33, the decoupler is a software routine stored on computer readable media (Fig. 1; servo operation is written in software in form of a routine and stored in the DSP 129 as illustrated in Fig. 17).

(c) with respect to Claim 34, the decoupler 129 is an analog circuit (Fig. 1; servo processing 129 includes analog circuit).

(d) with respect to Claim 35, the decoupler 129 is an electro-mechanical circuit (Fig. 1; DSP includes actuators 130 and 131 which are electro-mechanical circuit).

8. Claims 36 and 37 have limitations similar to those treated in the above rejection, and are met by the reference as discussed above. Claim 36 however also recites the following limitations which are also disclosed by the prior art of Watanabe:

(a) with respect to Claim 36, determining cross-coupling characteristics of a focus actuator and a tracking actuator of an optical pickup unit (Fig. 1; servo loop characteristics is the cross-coupling characteristics); determining a decoupling matrix to decouple the focus actuator and the tracking actuator (Fig. 1; DSP 129 and its servo processor include de-coupling matrix/servo parameters of tracking and focusing).

9. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

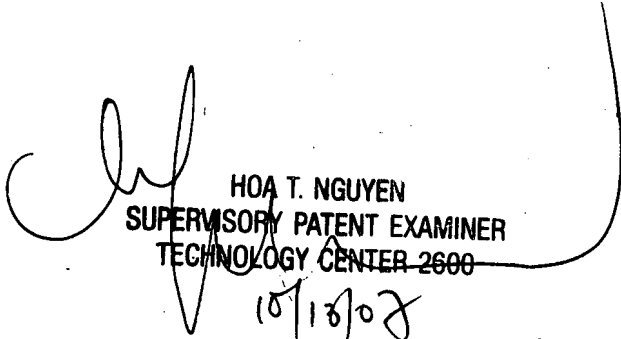
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Kim CHU whose telephone number is (571) 272-7585 between 9:30 am to 6:00 pm, Monday to Friday.

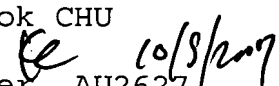
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa, Nguyen, can be reached on (571) 272-7579.

The fax number for the organization where this application or proceeding is assigned is (571) 273-8300

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9191 (toll free).


HOA T. NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600
10/16/07

Kim-Kwok CHU


Examiner AU2627
October 9, 2007
(571) 272-7585